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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/721,805	11/25/2003	Anissim A. Silivra	121.0001.DIV	6211

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EXAMINER	
VAN ROY, TOD THOMAS	
ART UNIT	**PAPER NUMBER**
2828	

DATE MAILED: 01/19/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/721,805	SILIVRA ET AL.
	Examiner	Art Unit
	Tod T. Van Roy	2828

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-6 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-6 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

The factual inquiries set forth in *Graham* **v.** *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1, and 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Conde et al. (US 5280490) in view of Schlesinger et al. (US 4331936).

With respect to claim 1, Conde teaches a tunable electron device providing electromagnetic radiation at broad frequency ranges, comprising: an electron gun (fig.1 #12) injecting an electron beam to travel within a device interaction region in an axial direction, a wiggler field system providing a first magnetic field causing the electron beam to travel in a helical trajectory along the axial direction (fig.1 #18, col.5 lines 57-64), and an axial magnetic field system providing a second magnetic field in the direction opposite to the axial direction (fig.1 #20, with right handed rotation, cols.5-6 lines 65-10) (cols.1-2 lines 60-40, inherent that the device of Conde would cause

parametric synchronism of the different eigen modes within the electron beam in order for stimulated emission to occur and the device to function). Conde does not teach the use of a control system connected to the electron gun and magnetic field systems. Schlesinger teaches a free electron laser that uses a control system connected to the electron gun as well as the magnetic filed sources (fig.1). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the electron device of Conde with the control of Schlesinger in order to control the frequency via changing the accelerator voltage or the field frequency (Schlesinger, col.4 lines 29-30).

With respect to claim 3, Conde and Schlesinger teach the controllable electron device outlined in the rejection to claim 1, wherein it is inherent that the eigen modes produced within the electron beam would comprise cyclotron and space charge waves.

With respect to claim 4, Conde and Schlesinger teach the controllable electron device outlined in the rejection to claim 1, and further teach control of the electron gun (Schlesinger, fig.1 #10) as well as control of the fields (Schlesinger, fig.1 #18) to control the output frequency (Schlesinger, col.4 lines 29-30). Conde and Schlesinger do not teach controlling the electron gun energy constant while varying the output frequency. It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the controls, and use their of, of Conde and Schlesinger with holding the power constant and varying the output frequency as this would be an obvious variation to a worker in the art to use the given controls and their described functions.

With respect to claim 5, Conde and Schlesinger teach the controllable electron device outlined in the rejection to claims 1 and 4, and Conde further teaches the

strengths of the first and second magnetic fields to vary the device's operating frequency (col.3 lines 3-15, wiggler, and axial electron velocity – influenced by the second, axial, applied field).

With respect to claim 6, Conde and Schlesinger teach the controllable electron device outlined in the rejection to claim 1, and Conde further teaches the use of a device resonator to vary the operating frequency (col.5 lines 25-30, waveguide controlling frequency characteristics, and col.5 lines 4-5, device described as a laser, which inherently consists of a resonator that influences the frequency).

Claim 2 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conde and Schlesinger in view of Szu (US 4538275).

With respect to claim 2, Conde and Schlesinger teach the controllable electron device outlined in the rejection to claim 1, but do not teach the electrons to travel at non-relativistic velocity. Szu teaches a free electron laser which does not use relativistic electrons (cols.1-2 lines 65-20). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the electron device of Conde and Schlesinger with the non-relativistic electrons of Szu in order to reduce energies of magnetic fields, size of the device, complexity, and cost (Szu, cols.1-2 lines 67-3).

Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Conde and Schlesinger in view of Szu and further in view of Suzuki (US 5291512).

With respect to claim 3, Conde and Schlesinger teach the controllable electron device outlined in the rejection to claim 1, but do not teach the eigen modes to include cyclotron waves and space charge waves. Szu teaches a free electron laser which describes the use of cyclotron waves (col.1 lines 14-26). Suzuki teaches a free electron laser which describes the use of space charge waves (col.2 lines 28-52). It would have been obvious to one of ordinary skill in the art at the time of the invention to combine the electron device of Conde and Schlesinger with the cyclotron waves of Szu in order to produce stimulated radiation in the far infrared (col.1 lines 20-23), and in addition with the space charge waves of Suzuki in order to produce coherent waves in the Raman regime (col.2 lines 50-52).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tod T. Van Roy whose telephone number is (571)272-8447. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Minsun Harvey can be reached on (571)272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TVR

MINSUN CHUNG
PRIMARY EXAMINER